REMARKS

The Office Action dated February 4, 2009, has been received and carefully noted. The following remarks are submitted as a full and complete response thereto.

Claims 1, 3-7, 12, 14-16, and 21-27 are currently pending in the application, of which claims 1, 7, 12, and 22-23 are independent claims. In view of the following remarks, Applicants respectfully request reconsideration and timely withdrawal of the pending rejections to the claims for the reasons discussed below.

Allowable Subject Matter

Claims 4-6, 14-16, 21, and 24-27 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten independent form including all of the limitations of the base claim and any intervening claims. Applicants thank the Examiner for this indication of allowable subject matter. Applicants respectfully submit that the claims from which claims 4-6, 14-16, 21, and 24-27 depend are also allowable, as discussed below. Accordingly, Applicants respectfully request that the objections to claims 4-6, 14-16, 21, and 24-27 be withdrawn.

Reconsideration and allowance of claims 4-6, 14-16, 21, and 24-27 are, thus, respectfully submitted.

Claim Rejections - 35 U.S.C. 103

Claims 1, 3, 7, 12, and 22-23 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over U.S. Patent No. 6,137,791 of Frid et al. ("Frid") in view of U.S. Patent No. 6,370,380 of Norefors et al. ("Norefors") and further in view of Candidate Access Router Discovery, October 2002, IETF Seamoby Working Group of Chaskar et al. ("Chaskar"). The Office Action acknowledged that Frid fails to disclose or suggest all of the features of claim 1, 3, 7, 12, and 22-23, and cited Norefors and Chaskar to remedy the deficiencies of Frid with respect to this rejected claim. Applicants respectfully submits that each of claims 1, 3, 7, 12, and 22-23 recites subject matter that is neither disclosed nor suggested in the combination of Frid, Norefors, and Chaskar.

Independent claim 1, upon which claims 3-6 and 24-25 depend, is directed to a method including authenticating a mobile node by an access router. The method also includes authorizing the mobile node to participate in a candidate access router discovery procedure. The method further includes maintaining, by the access router within a mobile internet protocol environment, a cache of neighboring access routers as handover candidates, capabilities of the neighboring access routers, and associated access points of the neighboring access routers. Access routers are considered neighbors only if the access routers include access points with overlapping coverage areas. The method additionally includes populating the cache with a cache entry in response to a handover action of the mobile node. The cache entry concerns a neighboring access router, the

capabilities of the neighboring access router, and an associated access point from which the mobile node is handed over. The cache entry is tagged with authentication information of the mobile node. A total number of cache entries that can be tagged and thus introduced into the cache by the mobile node is limited.

Independent claim 7 is directed to a system including a plurality of access routers within a mobile internet protocol environment, each of the access routers configured to authenticate a mobile node, to authorize the mobile node to participate in a candidate access router discovery procedure, and to maintain a cache of neighboring access routers as handover candidates, capabilities of the neighboring access routers, and associated access points of the neighboring access routers. The access routers are considered neighbors only if the access routers include access points with overlapping coverage areas. The system also includes a plurality of mobile nodes, each of the mobile nodes configured to perform a handover action between the access routers. The cache is configured to be populated with a cache entry in response to a handover action of a mobile node. The cache entry concerns a neighboring access router, the capabilities of the neighboring access router, and an associated access points from which the mobile node is handed over. The cache is further configured to tag the cache entry with authentication information of the handover action performing mobile node, and to limit a total number of entries that can be tagged and thus introduced into the cache by any given mobile node.

Independent claim 12, upon which claims 14-16, 21, and 26-27 depend, is directed to an apparatus including a first controller configured to authenticate a mobile node. The apparatus also includes a second controller configured to authorize the mobile node to participate in a candidate access router discovery procedure. The apparatus further includes a cache of neighboring access routers as handover candidates, capabilities of the neighboring access routers, and associated access points of the neighboring access routers. Access routers are considered neighbors only if the access routers include access points with overlapping coverage areas. The cache is configured to be populated with a cache entry in response to a handover action of the mobile node. The cache entry concerns a neighboring access router, the capabilities of the neighboring access routers, and an associated access points from which the mobile node is handed over. The cache is further configured to tag the cache entry with authentication information of the handover action performing mobile node, and to limit a total number of entries that can be tagged and thus introduced into the cache by any given mobile node.

Independent claim 22 is directed to a computer program, embodied on a computer readable medium, for controlling a processor to implement a method including authenticating a mobile node by an access router. The method also includes authorizing the mobile node to participate in a candidate access router discover procedure. The method further includes maintaining, by the access router within a mobile internet protocol environment, a cache of neighboring access routers as handover candidates,

capabilities of the neighboring access routers, and associated access points of the neighboring access routers. Access routers are considered neighbors only if the access routers include access points with overlapping coverage areas. The method additionally includes populating the cache with a cache entry in response to a handover action of the mobile node. The cache entry concerns a neighboring access router, the capabilities of the neighboring access router, and an associated access point from which the mobile node is handed over. The cache entry is tagged with authentication information of the mobile node. A total number of cache entries that can be tagged and thus introduced into the cache by the mobile node is limited.

Independent claim 23 is directed to an apparatus including authentication means for authenticating a mobile node. The apparatus also includes authorization means for authorizing the mobile node to participate in a candidate access router discovery procedure. The apparatus further includes caching means for storing neighboring access routers as handover candidates, capabilities of the neighboring access routers, and associated access points of the neighboring access routers. Access routers are considered neighbors only if they include access points with overlapping coverage areas. The caching means is configured to be populated with a caching means entry in response to a handover action of the mobile node. The caching means entry concerns a neighboring access router, the capabilities of the neighboring access router, and an associated access point from which the mobile node is handed over. The caching means is further

configured to tag the caching means entry with authentication information of the handover action performing mobile node, and to limit a total number of entries that can be tagged and thus introduced into the caching means by any given mobile node.

Applicants respectfully submit that the combination of Frid, Norefors, and Chaskar fails to disclose or suggest all of the features of any of the presently pending claims.

Frid describes a roaming mechanism enabling a mobile station to roam between a first data packet network utilizing a Mobile IP Method (MIM) and a second data packet network utilizing a Personal Digital Cellular Mobility Method (PMM). The PMM network includes a foreign agent (FA) for enabling a mobile station associated with the MIM network and currently roaming within the PMM network to communicate packet data with an associated home agent (HA). The PMM network also includes an HA for enabling a mobile station associated with the PMM network and currently roaming within the MIM network to communicate packet data with an associated FA (*see* Frid at Abstract).

Norefors describes a method for protecting communications relating to a mobile terminal during a handover of the mobile terminal from a first access point to a second access point, in a mobile, wireless telecommunications network. The method includes transmitting a security token from the first access point to the mobile terminal and from the mobile terminal to the second access point. The method also includes transmitting

the security token from the first access point to the second access point through a fixed network to which both the first and the second access points are connected. The method also includes establishing a communications link between the mobile terminal and the second access point to achieve secure handover if the second access point determines that the security token received from the mobile terminal matches the security token received from the first access point (*see* Norefors at Abstract).

Chaskar describes a mobile node (MN) or a MN's current access router (AR) being required to discover the identities of candidate ARs (CARs) for a handover of the MN from one AR to another, along with their capabilities, prior to the initiation of the handover. The act of discovery of CARs has two aspects to it: identifying the Internet Protocol (IP) addresses of the CARs and finding the capabilities of those CARs. This process is called "candidate access router discovery" (CARD). At the time of the handover, that CAR, whose capabilities are a good match to the preferences of the MN, may be chosen as a target AR (TAR) for the handover (*see* Chaskar at Abstract).

Applicants respectfully submit that the combination of Frid, Norefors, and Chaskar fails to disclose or suggest all of the features of any of the presently pending claims. Specifically, the combination of Frid, Norefors, and Chaskar does not disclose or suggest, at least, "authorizing the mobile node to participate in a candidate access router discovery [CARD] procedure," as recited in independent claim 1 and similarly recited in the other independent claims. The Office Action asserted that these features are disclosed

by Frid at column 4, lines 40-64. In the cited portion, Frid refers to a home location register (HLR) that authenticates a mobile station.

However, Frid fails to disclose or suggest authorizing the mobile station of Frid to participate in the CARD procedure of the claimed invention. Accordingly, Frid does not disclose or suggest, at least, "authorizing the mobile node to participate in a candidate access router discovery [CARD] procedure," as recited in independent claim 1 and similarly recited in the other independent claims. As clearly supported in the specification, "To prevent or reduce 'denial-of-service' attacks, it is considered that the access router typically authenticates the mobile terminal and ensures that it is authorized to participate in the candidate access router discovery process" (*see* Specification at paragraph 43). In contrast, Frid fails to even mention the CARD procedure of the claimed invention.

Norefors and Chaskar do not cure these deficiencies of Frid. Norefors refers to an access point that authenticates a mobile terminal (*see, e.g.,* Norefors at column 3, lines 12-22), but like Frid, fails to disclose or suggest the CARD procedure of the claimed invention. Chaskar refers to a MN performing a CARD process, as described above, but does not disclose or suggest the authorization of the MN to participate in the CARD process. In other words, Chaskar fails to disclose or suggest ensuring whether the MN of Chaskar is able to participate in the CARD process. Accordingly, the combination of Frid, Norefors, and Chaskar does not disclose or suggest, at least, "authorizing the mobile

node to participate in a candidate access router discovery [CARD] procedure," as recited in independent claim 1 and similarly recited in the other independent claims.

In addition, the combination of Frid, Norefors, and Chaskar fails to disclose or suggest, at least, "wherein a total number of cache entries that can be tagged and thus introduced into the cache by the mobile node is limited," as recited in independent claim 1 and similarly recited in the other independent claims. The Office Action asserted that these features are disclosed by Frid at column 4, lines 36-48. In the cited portion, Frid refers to the HLR that is a centralized database for storing subscription data representing the mobile station and for maintaining location data reflecting the mobile station's current location and registration status (*see also* Frid at column 4, line 49). Furthermore, the HLR stores data correlating the received mobile identification number with a corresponding IP address assigned to the mobile station (*see* Frid at column 4, lines 49-53).

However, Frid does not disclose or suggest that a total number of entries that can be tagged and thus introduced into the HLR of Frid by the mobile station is limited. Accordingly, Frid fails to disclose or suggest, at least, "wherein a total number of cache entries that can be tagged and thus introduced into the cache by the mobile node is limited," as recited in independent claim 1 and similarly recited in the other independent claims. As clearly supported in the specification, "The access router can ... limit the total number of cache entries attributed to any one mobile terminal" (*see* Specification at

paragraph 50). In Frid, there is no mention of limiting the total number of entries attributed to any one mobile station in the HLR of Frid.

Norefors and Chaskar do not cure these deficiencies of Frid. As discussed above, Norefors refers to a method for protecting communications relating to a mobile terminal during a handover, but fails to disclose or suggest that the total number of cache entries that can be tagged and thus introduced into a cache by a mobile node is limited. Chaskar refers to a list of CARs (*see* Chaskar at page 7, section 4.3.1), but does not disclose or suggest that the total number of entries that can be tagged and thus introduced in the list by a mobile node is limited. Accordingly, the combination of Frid, Norefors, and Chaskar fails to disclose or suggest, at least, "wherein a total number of cache entries that can be tagged and thus introduced into the cache by the mobile node is limited," as recited in independent claim 1 and similarly recited in the other independent claims.

For at least the reasons discussed above, Applicants respectfully submit that the combination of Frid, Norefors, and Chaskar does not disclose or suggest all of the elements of independent claims 1, 7, 12, and 22-23. Accordingly, Applicants respectfully request that the rejections of independent claims 1, 7, 12, and 22-23 be withdrawn.

Claim 3 depends from, and further limits, independent claim 1. Thus, claim 3 recites subject matter that is neither disclosed nor suggested in the combination of Frid, Norefors, and Chaskar. Accordingly, Applicants respectfully request that the rejection of claim 3 be withdrawn.

Reconsideration and allowance of claims 1, 3, 7, 12, and 22-23 are, therefore, respectfully submitted.

Conclusion

For at least the reasons discussed above, Applicants respectfully submit that the cited reference fails to disclose or suggest all of the elements of the claimed invention. These distinctions are more than sufficient to render the claimed invention unanticipated and unobvious. It is thus respectfully requested that all of claims 1, 3-7, 12, 14-16, and 21-27 be allowed, and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicants' undersigned representative at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,

Alicia M. Choi
Registration No. 46;621

Customer No. 32294
SQUIRE, SANDERS & DEMPSEY LLP
14TH Floor
8000 Towers Crescent Drive
Vienna, Virginia 22182-6212
Telephone: 703-720-7800
Fax: 703-720-7802

AMC:LHT:kh: sjm